

## Claims

1. A method for a communication infrastructure to speed uplink data setup, the method comprising the steps of:

- 5       reserving, by a packet control unit (PCU) in the communication infrastructure, packet data resources needed for an uplink connection from a communication unit of a plurality of communication units to the communication infrastructure that has not yet been requested by the communication unit and is not yet needed by the communication unit, wherein the packet data resources comprise at least a portion of a packet data channel;
- 10       sending, by the PCU to a basestation transceiver system (BTS), a message identifying the packet data resources reserved;
- 15       transmitting, by the PCU via the BTS, an uplink transmit allowance message for the at least a portion of the packet data channel; and
- receiving, by the PCU, an indication that the packet data resources reserved have been used to establish the uplink connection.

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2. The method of claim 1 wherein the packet data resources comprise a subchannel of a packet data channel, a timing advance index, and a temporary flow identifier.

25 3. The method of claim 1 wherein the step of receiving the indication comprises receiving a message from the BTS indicating that the BTS assigned the packet data resources to the communication unit.

4. The method of claim 1 wherein the step of receiving the indication  
30 comprises receiving data from the communication unit via the uplink connection.

5. The method of claim 1 further comprising the step of sending, by the PCU to the BTS, a message canceling the reservation of packet data resources reserved.

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6. The method of claim 1 further comprising the step of after the indication is received, reserving packet data resources needed for a second uplink connection from a second communication unit of the plurality of communication units to the communication infrastructure that has not yet been requested by the second communication unit and is not yet needed by the second communication unit.

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7. The method of claim 1 further comprising the step of after the indication is received and if communication unit demand for uplink connections is above a threshold, reserving packet data resources needed for a second uplink connection from a second communication unit of the plurality of communication units to the communication infrastructure that has not yet been requested by the second communication unit and is not yet needed by the second communication unit.

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8. The method of claim 1 further comprising the step of repeatedly transmitting, by the PCU via the BTS, the uplink transmit allowance message for the at least a portion of the packet data channel.

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9. The method of claim 1 further comprising the step of reserving at least one additional packet data resource needed for additional uplink connections from additional communication units of the plurality of communication units to the communication infrastructure that have not yet been requested by the additional communication units and are not yet needed by the additional communication units.

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10. The method of claim 9 further comprising the step of determining the number of additional packet data resources to reserve based on a rate of indications that packet data resources reserved have been used to establish uplink connections.

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11. The method of claim 9 further comprising the step of repeatedly transmitting, by the PCU via the BTS, uplink transmit allowance messages for at least some of the at least one additional packet data resource reserved, wherein the relative frequency of transmission of each uplink transmit allowance message is based on the relative order of reservation of each of the corresponding packet data resources.

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12. The method of claim 1 wherein the step of reserving comprises the step of reserving, by the PCU, packet data resources usable by the greatest number of communication units of the plurality of communication units.

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13. A method for a communication infrastructure to speed data uplink setup, the method comprising the steps of:

5 receiving, by a BTS from a PCU, a message identifying packet data resources reserved, wherein the packet data resources reserved comprise at least a portion of a packet data channel needed for an uplink connection from a communication unit to the communication infrastructure that has not yet been requested by the communication unit and is not yet needed by the communication unit;

10 receiving, by the BTS from the communication unit, a request for an uplink connection;

assigning, by the BTS to the communication unit, the packet data resources reserved; and

15 transmitting, by the BTS to the communication unit, an assignment message identifying the packet data resources assigned to the communication unit.

14. The method of claim 13 further comprising the step of sending, by the BTS to the PCU, an indication that the packet data resources reserved have been assigned.

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15. The method of claim 13 wherein the packet data resources reserved comprise a subchannel of a packet data channel, a timing advance index, and a temporary flow identifier.

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16. A communication infrastructure comprising:  
a packet control unit (PCU) capable of reserving packet data  
resources needed for an uplink connection from a  
communication unit to the communication infrastructure that  
has not yet been requested by the communication unit and  
is not yet needed by the communication unit, wherein the  
packet data resources comprise at least a portion of a  
packet data channel, capable of sending to a basestation  
transceiver system (BTS) a message identifying the packet  
data resources reserved, capable of transmitting via the BTS  
an uplink transmit allowance message for the at least a  
portion of the packet data channel, and capable of receiving  
an indication that the packet data resources reserved have  
been used to establish the uplink connection.

17. The communication infrastructure of claim 16 wherein the PCU is  
further capable of reserving at least one additional packet data resource  
needed for additional uplink connections from additional communication  
units to the communication infrastructure that have not yet been  
requested by the additional communication units and are not yet needed  
by the additional communication units.

18. The communication infrastructure of claim 17 wherein the PCU is  
further capable of determining the number of additional packet data  
resources to reserve based on a rate of indications that packet data  
resources reserved have been used to establish uplink connections.

19. The communication infrastructure of claim 16 wherein the PCU is  
further capable of repeatedly transmitting via the BTS uplink transmit  
allowance messages for at least some of the at least one additional  
packet data resource reserved, wherein the relative frequency of

transmission of each uplink transmit allowance message is based on the relative order of reservation of each of the corresponding packet data resources.

- 5    20.    A communication infrastructure comprising:  
         a basestation transceiver system (BTS) capable of receiving from a  
         PCU a message identifying packet data resources reserved,  
         wherein the packet data resources reserved comprise at  
10           least a portion of a packet data channel needed for an uplink  
         connection from a communication unit to the communication  
         infrastructure that has not yet been requested by the  
         communication unit and is not yet needed by the  
         communication unit, capable of receiving from the  
         communication unit a request for an uplink connection,  
15           capable of assigning to the communication unit the packet  
         data resources reserved, and capable of transmitting to the  
         communication unit an assignment message identifying the  
         packet data resources assigned to the communication unit.

- 20    21.    The communication infrastructure of claim 20 wherein the BTS is  
         further capable of sending to the PCU an indication that the packet data  
         resources reserved have been assigned.